MSC Guidelines for Review of Foreign Liquefied Gas Carrier Certificate Of Compliance (COC) Endorsement Application (Subchapter O Endorsement)

Procedure Number: T2-6 Revision Date: 11/01/01

References

a. 46 CFR Subchapter O, Part 154
b. IMO Code for Existing Ships Carrying Liquefied Gases in Bulk, Resolution A.329(IX)
c. IMO Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, Resolution A.328(IX)
d. IMO International Gas Carrier Code, Resolution MSC.5(48) and Resolution MSC.30(61), 1993 Edition.
e. Marine Safety Manual (MSM), Volume II, Section D, Chapter 6 (http://www.uscg.mil/hq/g-m/nmc/pubs/msm/vol2.htm)

Disclaimer

These guidelines were developed by the Marine Safety Center staff as an aid in the preparation and review of vessel plans and submissions. They were developed to supplement existing guidance. They are not intended to substitute or replace laws, regulations, or other official Coast Guard policy documents. The responsibility to demonstrate compliance with all applicable laws and regulations still rests with the plan submitter. The Coast Guard and the U. S. Department of Transportation expressly disclaim liability resulting from the use of this document.

Contact Information

If you have any questions or comments concerning this document, please contact the Marine Safety Center by e-mail or phone. Please refer to the Procedure Number T2-6.

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General Review Guidance

Certificate of Compliance, Initial Application

The Marine Safety Center will:

- Check the Coast Guard Port State Information Exchange (PSIX) at http://psix.uscg.mil/. Ensure the vessel is in the system and that it has a valid Certificate of Financial Responsibility (COFR). The status of the COFR can be checked at www.cofr.npfc.gov. If not, instruct the owner/agent to contact the National Pollution Fund Center (NPFC), Vessel Certification Division at Ph: (202) 493-6780 Fax: (202) 493-6781 to acquire one. The vessel will NOT be allowed to enter U.S. waters without one.

- Account for all required parts of the application. See 46 CFR 154.22, reference (a). The list that follows is provided as a quick reference only. The above reference should be reviewed for specific application instructions and details.

  (1) The vessel's valid IMO Certificate of Fitness
  (2) A description of the vessel
  (3) Specification for the cargo containment system.
  (4) A general arrangement plan of the vessel
  (5) A midship section plan of the vessel
  (6) Schematic plans of the liquid and vapor cargo piping.
  (7) A firefighting and safety plan
  (8) If the applicant is requesting an endorsement for the carriage of ethylene oxide, a class society certification that the vessel meets 154.1725(a)(4),(5), and (7).
  (9) If the vessel is a new gas vessel, or an existing vessel that does not meet 154.12 (b), (c), or (d) –
    (i) A certification from a class society that the vessel –
      (A) Has enhanced grades of steel meeting 154.170 and
      (B) Meets 154.701, or 154.703 and
    (ii) The vessel's valid SOLAS Cargo Ship Safety Construction Certificate and Cargo Ship Safety Equipment Certificate.
  (10) Any additional plans requested by the Marine Safety Center to determine whether the vessel meets 46 CFR 154.

- Review the Certificate of Fitness (COF) (See procedures for reviewing COFs below)

- Review all certificates and plans, paying attention to validity dates, vessel identification information and content.

- Produce a Subchapter O Endorsement (SOE) and prepare it for issuance upon completion of vessel exam by the local Marine Safety Office.

General Review Guidance

Coast Guard Design Standards

- The list that follows provides details on the four general design areas where the Coast Guard requires design standards exceeding those in the IMO Codes. These areas are summarized from Part 154 as follows:

  - ALLOWABLE STRESS LEVELS FOR INDEPENDENT TANK TYPES B AND C: The stress factors for use in designing independent Type B tanks are shown in Table 2 of Part 154 (reprinted below). Stress factors A and B also apply when designing Type C tanks. Certification of this item should be indicated on the Certificate of Fitness. For a vessel to be accepted as Type IIPG, the minimum design MARVS must be based on the stress factors from Table 2 of Part 154:

46 CFR Part 154 Table 2 - Values For Stress Factors

	Stress Factors			
	A	B	C	D
Nickel Steel and Carbon Manganese Steel	4.0	2.0	3.0	1.5
Austenitic Steel	4.0	1.6	3.0	1.5
Aluminum Alloys	4.0	1.5	3.0	1.5

  - CRACK ARRESTING STEEL: The following grades of steel, or their equivalents, must be used along the length of the Cargo Area in the following locations as required by 46 CFR 154.170:

Deck Stringer	Grade E
Sheer Strake	Grade E
Turn of the Bilge	Grade D or E

    Certification of this item may be made on the Certificate of Fitness or on a separate certificate issued by the Classification society or administration.

  - DESIGN AMBIENT TEMPERATURES: U. S. regulations require lower ambient design temperatures for the hull structure (see 46 CFR 154.174, 154.176 and 154.466):

    - For Continental United States and Hawaii:
      air (at 5 knots) - -18°C (0°F)
      seawater 0°C (32°F)

- For Alaska:
  air (at 5 knots) - -29°C (-20°F)
  seawater -2°C (28°F)

  The hull structure design temperatures must be indicated on the Certificate of Fitness. *(For Gas Carriers with independent Type C tanks, it is sufficient to use the design ambient temperatures from the IMO Code for Existing Ships Carrying Liquefied Gases in Bulk or the International Gas Carrier Code.)*

- CARGO PRESSURE/TEMPERATURE CONTROL: Except for the carriage of methane, the cargo containment system must be designed to maintain the cargo indefinitely without venting to the atmosphere at the upper design ambient temperatures of 45°C for air and 32°C for seawater (see 46 CFR 154.701). For methane, the cargo containment system must be designed to maintain the cargo without venting to the atmosphere for a minimum period of 21 days while the vessel is in port and under ambient conditions of 45°C for air and 32°C for seawater (see 46 CFR 154.703). Certification of this item may be made on the Certificate of Fitness or on a separate certificate issued by the Classification society or administration.

Certificate of Fitness (COF), All

- Upon receipt of a Certificate of Fitness (COF), the Marine Safety Center will:
- Page check the document. Ensure the document has a valid signature and issue and expiration dates, and correct vessel name.
- Determine which resolution applies to the vessel based on the Build/Keel Laid date on the COF. This will determine whether the vessel is a "New" or "Existing" vessel. The following defines the current resolutions:

  - Code for Existing Ships Carrying Liquefied Gases in Bulk
    Resolution A.329 (IX)
    Adopted: 12 November 1975
    Applies to: Ships delivered on or before 31 October 1976, or
    Ships delivered after 31 October 1976 but prior to the application of the Gas Carrier Code (Resolution A.328 (IX))

  - Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Gas Carrier Code)
    Resolution A.328 (IX)

Adopted: 12 November 1975
Applies to: Ships for which a building contract is placed after 31 October 1976 or
In the absence of a building contract, the keel of which is laid or which is at a similar stage of construction after 31 December 1976, or

Ships for which the delivery date is after 30 June 1980, or

Major conversions for which the contract was placed after 31 October 1976, or
In the absence of a contract, the conversion of which is begun after 31 December 1976, or
Conversion was completed after 30 June 1980.

- International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code)
  Resolution MSC.5(48)
  Adopted: 17 June 1983
  Applies to: Ships for which the keel is laid, or

  Construction identifiable with the ship began; and assembly of that ship commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less, or
  Irrespective of the construction date, construction for conversion to a Gas Carrier that commenced,
  On or after 1 July 1986

- International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) 1993 edition:
  Resolution MSC.30(61)
  Adopted: December 1992, amendments that entered into force on 1 July 1994
  Applies to: Ships for which the keel is laid, or
  Construction identifiable with the ship began; and assembly of that ship commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less, or
  On or after 1 October 1994

Certificate of Fitness, New Vessel

The Marine Safety Center will:

- Review the tank types on the vessel, either A, B, or C independent, etc.
- If tanks are Type B or C Independent: [Applies to cargo and deck tanks]
  - Check to ensure the proper stress factor was used in determining the Tank Maximum Allowable Relief Valve Setting (MARVS), based on the tank material. Stress factor of A=4 for type C tanks, and for type B tanks see Table 2, 46 CFR 154. If an incorrect stress factor has been applied, the COF will not be accepted. See reference (a), 154.447.
- If type C tanks: [Applies to cargo tanks only]
  - Check the ambient design temperature values. Ensure they are less than or equal to 5°C for Air and 0°C for water, reference (d), Chapter 4.7.
  - Check the minimum design temperature of the tanks. The temperature must be equal to or lower than the lowest boiling temperature at atmospheric pressure of the cargoes being carried.
- If the tank types are those other than type C: [Applies to cargo tanks only]
  - Check the ambient design temperature values. Ensure they are less than or equal to 0°C for Air and -18°C for Water. This allows cargo carriage in the United States, EXCLUDING Alaska. For carriage in ALL US waters (including Alaska), ensure the temperatures are less than or equal to -2°C for Air and -29°C for Water. If the ambient design temperatures are not within these standards, the vessel must meet 46 CFR 154.178 for hull heating systems. If documentation is not provided certifying this, then the vessel can only be authorized carriage of those cargoes that do NOT require a secondary barrier. See 46 CFR 154.459, Table 3, and 154.465/6.
  - Check the minimum design temperature of the tanks. The temperature must be equal to or lower than the lowest boiling temperature at atmospheric pressure of the cargoes being carried. If the minimum design temperature is not within this standard, the vessel must meet 46 CFR 154.701 for cargo refrigeration systems.

- Review the list of cargoes. Ensure that they are approved for carriage in the United States in accordance with lists in 46 CFR 153, 46 CFR 154 and the International Gas Carrier Code.

Certificate of Fitness, Existing Vsl.

Existing vessels were originally approved for cargo carriage in US waters based on vessel plan review. Therefore, as a general rule, the authorizations granted and/or restrictions placed on the vessel through the plan review process should remain in effect. Some general things to review follow.

The Marine Safety Center will:

- Check the ambient design temperature values. Ensure they are less than or equal to 5°C for Air and 0°C for Water, in accordance with the International Gas Carrier (IGC) Code.

- Verify whether or not the vessel has been granted authorization for cargo carriage in Alaskan waters. Note: As a result of Coast Guard Plan Review, the vessel may have been granted authorization for carriage in Alaskan waters without Type C tanks and/or without meeting the lower ambient design temperatures. This authorization will remain in effect (i.e. These vessels will not be prohibited from operating in Alaskan waters because the hull ambient design temperatures don't meet IGC Code). See 46 CFR 154.12 (b).

- Check the minimum design temperature of the tanks. The temperature must be equal to or lower than the lowest boiling temperature at atmospheric pressure of the cargoes being carried. If the minimum design temperature is not within this standard, the vessel must meet 46 CFR 154.701 for cargo refrigeration systems.

- Compare the cargo list of the current COF to that of the previous one. The lists should be the same. Only cargoes authorized through plan review should be carried. Authorization for other cargoes requires a special request.

Subchapter O Endorsement (SOE)

The following list details specific cargo carriage requirements which MAY appear on the vessel's SOE depending on the cargoes authorized for carriage:

- Per chapter 17.20 of the IGC Code, Propylene Oxide is authorized for carriage subject to the following special restrictions:

- Classification society certification that the required cargo piping separation has been achieved must be on board the vessel and available to Coast Guard boarding personnel.

- All gaskets which may contact propylene oxide liquid or vapor must be constructed from spirally wound stainless steel with a filler of Teflon or similar fluorinated polymer.

- Neoprene, natural rubber, asbestos mixed with other materials, and materials containing oxides of magnesium (such as mineral wools) may not be used for packing, insulation and similar items in the propylene oxide containment system and piping.

- Per chapter 17.16 and 17.20 of the IGC Code, the following requirements apply to the carriage of ethylene oxide/propylene oxide mixtures (containing a maximum of 30% ethylene oxide):

  - The requirements for propylene oxide listed in the Certificate of Fitness and listed above must be followed.

  - When this cargo is carried without refrigeration the cargo tank relief valve setting shall not be less than 120 kPa gauge (17 psig).

- The following requirements apply to the cargo C-4 Mixture:

  - The weight percent of acetylene may not exceed 5.0 percent.

  - The weight percent of propadiene may not exceed 0.5 percent.

  - If the weight percent of butadiene exceeds 10 percent, the C-4 Mixture must be inhibited to prevent self-reaction in accordance with chapter 17 of the IMO Gas Code.

  - A manufacturer's certificate specifying the composition of the cargo must be on board the vessel and available to Coast Guard boarding personnel.

- Methyl Acetylene Propadiene Mixtures (MAPP Gas) shall be carried only in one of the two compositions specified in section 17.18 of the IMO Gas Code (including the third set of amendments).